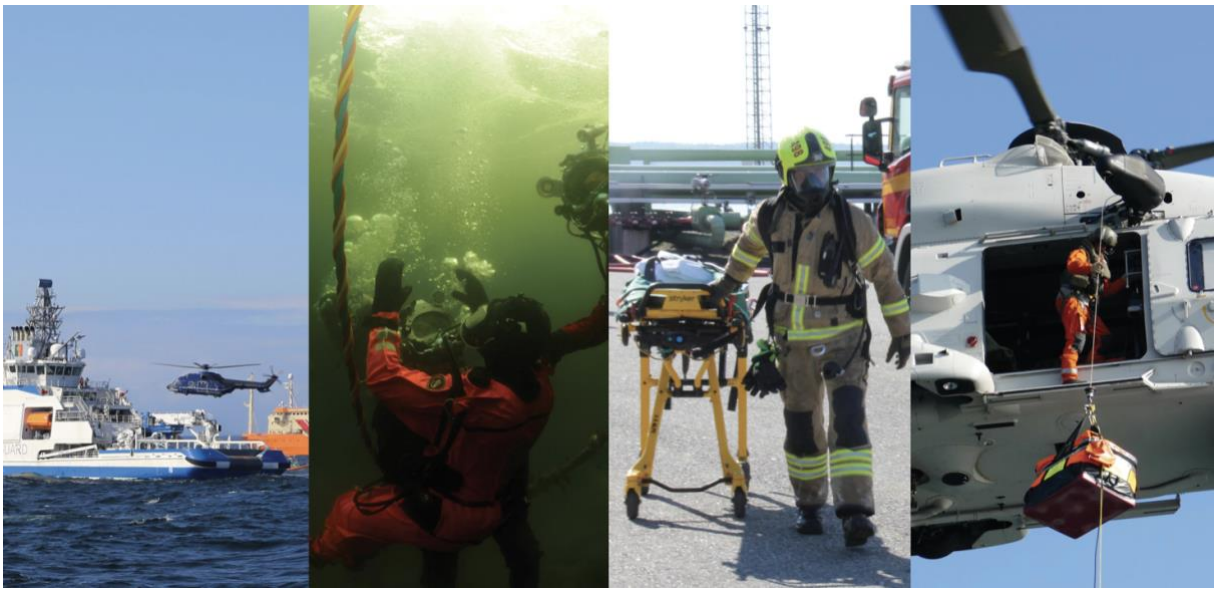
“Current status and future developments in maritime incident control”

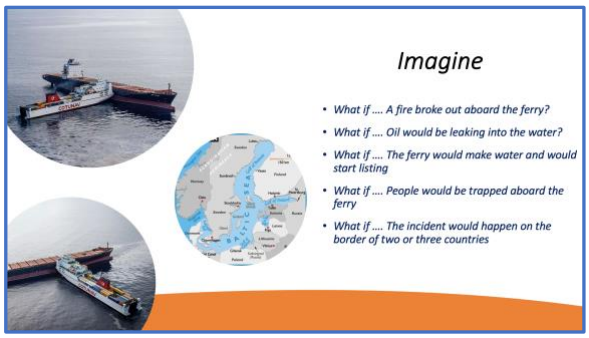


ResQU2

Increasing Emergency Preparedness

Date:	*March 30, 2021*
Author:	*Ruud Plomp (Artemas)*
Commissioning party	*Safety Region Zeeland*

Introduction

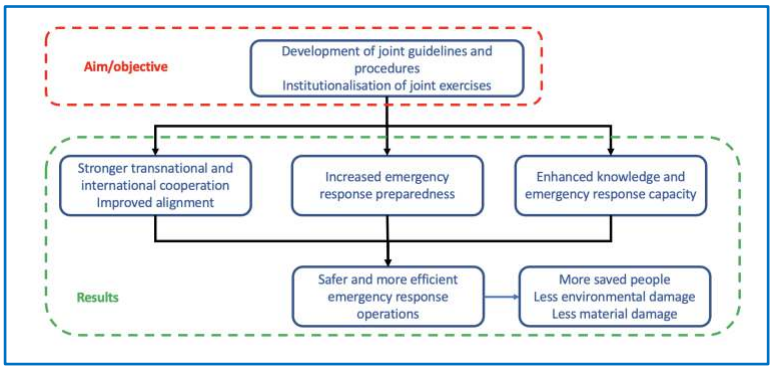


Background information

The ResQU2 Project Platform was formed to join forces and expertise around fire and rescue services capacity to respond to accidents in ports at sea. The aim of the ResQU2 project platform is to develop joint guidelines, procedures, and institutional frequent joint exercises. Working together and sharing knowledge and expertise leads to a state of increased emergency preparedness, a better understanding of each other's knowhow and possibilities, and a stronger network. With the ultimate result, saving more lives at sea by working safer and more efficient.

The ResQU2 Project Platform consists of organisations that were participating in four projects focusing on improving the capacity to respond to accidents in ports and at sea. The target groups involved were the specific Authorities, the Fire and Rescue services as well as the Shipping Companies

Project	***Focus***
HAZARD	Accidents with harmful chemicals in ports
ChemSAR	Plans and procedures in HNS incidents
DiveSMART	Passenger ship accidents
MIRG-EX	Response teams to manage incidents on board of ships



The aim of the ResQU2 project platform is to develop joint guidelines, procedures, and institutionalise frequent joint exercises. The main results will be increased emergency preparedness, and enhanced knowledge and capacity of the rescue authorities, actors and decision makers as well as stronger transnational and international cooperation. In practice, more safe and efficient rescue operations and more lives saved at our seas.

Main outputs of the assignment

Questions to be answered

- What are the best practices in technology currently used by the partners in the ResQU2 Project Platform?
- What are the best practices in technology currently used by the wide maritime incident response and SAR community?
- What are new developments in the field of maritime incident response and SAR?
- What changes and new trends are waiting?

Types of technology

The types of technology evaluated will be communication, detection, underwater, safety and wearable technologies. The best practices including a set of recommendations will be suitable for testing in future trainings and exercises of partners' incident response, and search and rescue teams. Finally, they could be the basis for improving Standard Operational Procedures of partners by linking technology into procedures of safe work.

Vital stakeholders

Being part of the ResQU2 platform, the following 8 parties will play an important role during the execution of the project:

- The Safety Region Zeeland
- University of Turku
- Finnish Border Guard
- Estonian Police and Border Guard Board
- Swedish Coast Guard
- Naval Academy (Poland)
- Latvian Maritime Academy
- Fire and Rescue Department of Lithuania.

Acknowledgements

This report would not have been possible without the contribution of the representatives of the members of the ResQU2 platform:

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Versions

Version	***Date***	***Adjustments***
First draft	March 11, 2021	
Second draft	March 23, 2021	• Additional comments from German representative • Additional comments from Finnish representative • Additional comments from Swedish representatives
Final	March 30, 2021	• Amendments from the Dutch perspective • Additional comments from Swedish representative

Executive summary

This report provides an overview of the current status of the maritime incident control in the Baltic Sea. It also provides an overview of (possible) future developments in the maritime incident response field, which could be of added value to further develop the quality of the maritime incident response in the Baltic Sea area.

Chapter 1 gives an overview of the current status of the maritime incident response capabilities of the partners in the ResQU2 Project Platform, both from an organisational and a technological point of view. This chapter consists of the following 6 sections:

1) Incident involving hazardous materials
2) Search and rescue operation involving diving teams
3) Search and rescue operation involving diving teams
4) Firefighting aboard ships
5) Counter pollution
6) Policy papers.

At the end of each paragraph an overview of some considerations and future developments of each specific topic/section is listed.

The information presented is a summary from the data retrieved from:

- Questionnaires
- Interviews
- Workshop on January 27, 2021,
- Information from different internet sources
- Feedback from the respondents on the draft report.

A summary of the most important observations and/or considerations

- There are substantial differences in response times among the different stakeholders involved in maritime incident response. This is something to keep in mind.
- It will be necessary to continue to work on the effectiveness of responding to maritime incidents. Especially from the point of view that incidents will happen that will be a combination of firefighting, chemical response, counter pollution and SAR (diving operations).
- In order to maintain and improve the (mutual) operational readiness regular meetings (joint tabletop exercises, expert meetings, etc.) in order to exchange knowledge, experience, future developments, etc. which could be used to further improve the usability of emergency response plans.
- The tracking of useful information and developments related to Emergency Response in the maritime industry. Stronger links with organisations as for example EMSA, IMO, (inter)national Investigation Branches, and Universities.
- There is a need to investigate time and efforts to evaluate the risks concerning new developments, such as the use of alternative fuels, autonomous shipping, the increase of ‘mega vessels’
- Consider the possibility to start discussions with IMO, EMSA, insurance companies and shipping companies about the preventive measures aboard ships.

In the last chapter four relevant recommendations/considerations are described:

1) Relevance of preparation and cooperation (alignment)
2) Strengthening of the network-capacity
3) Development of a mutual (Baltic Sea) emergency response capacity
4) Further improvement of the information management process

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1. Current status and future developments in maritime incident control

This chapter describes the outcomes of the information collected from the questionnaires, interviews and from different internet sources.

Status per topic

1.1 Incident involving hazardous materials

Leading questions from the questionnaire and interviews

- *What are the (operational) means available (hardware/equipment, etc.) for incidents involving hazardous materials in the maritime industry? What is still missing in your opinion?*
- *Till what extent have these means been tested/exercised under realistic circumstances?*
- *What type of incident scenarios are covered by the present available resources (hard- and software)? What type of incident scenarios are not (yet) covered, which should be covered in your opinion?*
- *Have you have run into situations (incidents/scenarios/exercises) in recent years, which showed (operational) gaps that still need to be resolved? Both from a national as well as international point of view.*
- *What is the available knowledge and experience? What is still missing in your opinion in order to achieve the desired/required goals?*
- *Imagine the future of technology in relation to chemical incidents: what developments do you see/expect in the next 10 to 20 years?*
- *Have you heard about any promising developments outside the Interreg Baltic Sea Region cooperation which could be of use for ResQU2?*

Overview of the operational status per country

Current status

Country	*Current status*
Sweden	• The Swedish Coast Guard, an independent civil authority under the Ministry of Defence, has national responsibility for dealing with spills of oil and other harmful substances in Swedish waters. • Sweden covers response to HNS in its NCP and has made a risk assessment that includes marine transport of HNS. • The Swedish Coast Guard has specialised response teams for marine incidents involving HNS. • There are several ships that are capable of responding to maritime incidents involving hazardous materials. • We are prepared for incidents aboard chemical tankers and bulk carriers. • Currently new materials (e.g., indicator substances) are tested that could be used in the future.
Finland	• The MIRG teams are situated in Turku and in Helsinki. • The MIRG teams are fully operational. - They train and exercise together. In the pre corona era the MIRG teams trained at least once per month.

	- The MIRG equipment is up to standard and comparable with other international MIRG teams. • The MIRG teams are transported by helicopters (Super Puma's) and ships. • Both the Coast Guard and the Fire Department do have ships that can be deployed in case of maritime incidents. - For incidents further away, the MIRG teams solely rely on the ships of the Coast Guard (additional information: Finnish Border Guard has two Coast Guard districts). - The Finnish Border Guard operates offshore Patrol vessels that are equipped for rescue operations, firefighting, emergency towing and demanding environmental duties (One of the FBG's vessels can operate in dangerous area e.g., as a safe platform to responders (DNV GL Chemrec class notation)).
Latvia	• At present the available state-owned equipment/materials can only be used for materials which have oil properties. - Terminals, which operate with hazardous and noxious substances have their own response equipment according to the requirements of State Firefighting Service. • The Fire Service has the following equipment and materials available: - 8 Dedicated chemical response units including equipment for HNS response - 4 decontamination tents for victims; - 4 containers and 5 trailers with absorbent and bones, equipment for collecting oil products in inland waters; • Recently Fire Service has participated in CBRN training in EU-CHEM-REACT (Ukraine) • Available knowledge and experience to respond to Hazardous and Noxious Substances (HNS) at sea is very scarce in the state authority sector. Squad for protection against weapons of mass destruction of the National Armed Forces is available for situation assessment and monitoring in case of HNS incident at sea. Few experts in the private sector might be consulted, but no co-operation with them has been established. Also, maritime chemical information service (Mar-Ice, Mar-CIS) of the European Maritime Safety Agency is utilized.
Estonia	• The Estonian Coast Guard is responsible for the coordination of response to HNS at sea. • Estonia's capability for responding to marine incidents involving HNS is very limited and relies on the same resources as for oil pollution response. • HNS spills are not currently incorporated into the national contingency plan. • Estonia compiles an annual risk assessment, which covers the marine transport of HNS.
Lithuania	• The Lithuanian Navy would be responsible for dealing with spills of HNS. • Lithuania does not specifically cover response to HNS in its national contingency plan and has not done any risk assessment specifically aimed at marine transport of HNS. • Lithuania's capability for responding to marine incidents involving HNS it is very limited and mainly relies on the same resources as for oil pollution response. • Lithuania does not have a specialised response team from marine incidents involving HNS. • In case of chemical spills, the Marine Research Department of the Environmental Protection Agency would be contacted for expert advice.
Poland	• Maritime incidents involving hazardous materials are the responsibility of the Polish Army. - No information was received from them. • Poland's capability for responding to marine incidents involving HNS is rather limited and mainly relies on the same resources as for oil pollution response. • The National Contingency Plan (NCP) covers response to HNS.
Germany	• A wide variety of technical equipment (including Scanning Infrared Gas Imaging System (SIGIS) and CT Analyst) is available. This equipment is managed and deployed by the Fire Department.

	• The organisation is well trained and prepared. - A large number of exercises (regular ones as well as large scale exercise as part of the EU projects like ChemSAR and Hazard) - Knowledge and experience were also gained during real emergencies of different sizes. • Although the organization is well prepared to respond to all the imaginable maritime incident scenarios, there are still certain elements that can be improved. - An example is the communication during exercises and incidents.
Netherlands	• The Dutch Coast Guard has national responsibility for dealing with spills of oil and other harmful substances on the Dutch part of the North Sea. • One of the tasks of the MIRG.EU team of the Safety Region Zeeland is responding to incidents at sea, involving chemicals (Hazmat Intervention). - MIRG's primary responsibility is stabilisation of the incident. - The MIRG will not perform an intervention with hazmat suits. MIRG is only doing interventions for category 1 or 2 of 'hazmat emergency preparedness and response'

What is missing?

Country	
Sweden	• There is a need for more ships that are capable of operating in areas with dangerous vapour clouds (e.g., in relation to flammable/explosive products/mixtures). • The Emergency Organisation is not yet prepared for incidents involving large container ships. • Operational experience (Swedish Coastguard) is lacking due to a minimum exposure to real incidents in combination with a shortage of realistic training moments.
Finland	• In order to be able to respond effectively, it will be necessary to organise and conduct more and better exercises with the other MIRG teams in the Baltic Sea. - Common training/exercises are crucial (including training/exercises with other authorities and organizations). - There are still quite some differences in equipment and work procedures between the teams. - Improvement on English language.
Latvia	• There is a lack of special equipment to detect the presence of a dangerous substances and to determine the hazards. • There is a lack of mobile decontamination equipment which can be used in field. - At present, only large tents are available for cleaning up large quantities of contaminated persons. • At present there is only equipment/materials available which can be used for oil-based substances. For other hazardous and noxious substances there are no operational means available that can be used at sea. - There is no equipment (and materials), nor are there any ships available which can be deployed in case of maritime incidents involving spills of hazardous and noxious substances (except oil) at sea. - There is a lack of suitable detection devices (analysers, metering devices). • Problems with communication equipment when working with Class A protective clothing. - The existing means of communication are not convenient and reliable when working with protective clothing. • Operational gaps were experienced during the latest incident involving a leaking HNS substance onboard a container ship. - Unfortunate no operational response improvements were made due to the 'fact' that the incident luckily resulted of in minimal impact/damage.

	• The 2020 exercise of the National Armed Forces involving HNS incident also showed most of the gaps, but no further actions were taken due to low priority of this issue on the national level. • A scenario that is not covered at all, are incidents involving radioactive substances or objects.
Estonia	• No information available.
Lithuania	• No information available.
Poland	• Incidents at sea are handled by the Polish army. - There is not yet a response from them.
Germany	• The Hamburg Fire & Rescue Service is well prepared for responding to HNS-incidents at sea. - The only thing missing is more specific knowledge about incidents involving CBNR.
Netherlands	• No information available.

Considerations and future developments

- There are more and more types of chemicals/substances that are being transported and sometimes being used as fuel. It will be necessary to follow these developments in order to be prepared for possible incidents involving these chemicals/substances.
- Use of drones (air and water):
  1) as tool to detect any hazardous materials
  2) as tool for assessment/reconnaissance, and
  3) as support for the risk assessment
- Need for improved and more sensitive detection equipment.
- The possibility of using unmanned aircraft with an integrated spectrometer and measuring equipment for the determination of the substance and for the determination of the explosive. In combination with the possibility of online transfer of information.
  1) Online hazard development modelling programme, data from “drones” (e.g., modelling of pollution taking into account meteorological conditions or leakage rates).
  2) Remote transfer of information to a rescuer using an image projection within a screen in protective clothing.
- The tracking of useful information and developments related to Emergency Response in the maritime industry. Stronger links with organisations as EMSA, IMO and divers national Investigation Branches.
  1) such as acquisition and provision of satellite based maritime incident response services (Clean Sea Net, Safe Sea Net etc.) and provision of remote piloted aerial system (RPAS) services to other regions, such as the Mediterranean Sea, Black Sea, North Sea etc.
  2) development and application of remote piloted aerial systems (drones) as well as underwater remote robots.

1.2 Search and rescue operation involving diving teams

Leading questions from the questionnaire and interviews

- *What are the (operational) means available for search and rescue diver response in the maritime industry? In relation to hardware (equipment, etc.). What is still missing in your opinion?*
- *Till what extent have these means been tested/exercised under realistic circumstances?*
- *What type of incident scenarios are covered by the present available resources (hard- and software)? What type of incident scenarios are not (yet) covered, which should be covered in your opinion?*
- *Have you have run into situations (incidents/scenarios/exercises) in recent years, which showed (operational) gaps that still need to be resolved? Both from a national as well as international point of view.*
- *What is the available knowledge and experience? What is still missing in your opinion in order to achieve the desired/required goals? Both from a national as well as international point of view.*
- *Imagine the future of technology in relation to SAR diving operations: what developments do you see/expect in the next 10 to 20 years?*
- *Have you heard about any promising developments outside the Interreg Baltic Sea Region cooperation?*

Overview of the operational status per country

Current status

Country	*Current status*
Sweden	• As a result of the experiences of the Italian rescue divers involved in the Costa Concordia disaster, the Swedish Coast Guard and the Swedish Armed Forces launched a national project that has successfully coordinated all professional Swedish divers and their equipment in order to increase preparedness and efficiency when an incident occurs. • Consequently, the DiveSMART Baltic project was joined, having the same aims in relation to coordinating and preparing divers across the Baltic Sea Region. • During the 'DiveSMART BALTIC project' several and different joint exercises under real circumstances were organised and performed. These exercises did contribute to an improved readiness and response. - In order to maintain this level of readiness and response it will be necessary to sustain and continue this cooperation.
Finland	• Diving operations are done by the Fire Department and therefore by the MIRG-teams.
Latvia	• There are no dedicated SAR divers for maritime incidents available. - The Fire service has a diving squad for internal waters, which are not qualified to operate at open sea. • The Navy has diving squads including a decompression chamber. - They are lacking the competence to remove persons from "air cushions" in sunken vessels. • There are two (civilian) decompression chambers in Latvian hospitals, which could be used for divers' decompression procedures.
Estonia	• SAR diving operations are executed by private diving companies.
Lithuania	• No information available
Poland	• When diving is included, there is a cooperation with the Swedish Coast Guard.

Germany	• There are four completely equipped divers 24/7 available. - They are equipped with ropes, airbags, side-scan-sonar, hydraulic spreader, and a hydraulic cutter. • The divers do exercise, and are tested, 3 or 4 times in the year under realistic circumstances.
Netherlands	• Diving is not part of the MIRG-organisation - Divers of the Fire Department are not allowed to dive deeper than 15 meters • SAR diving operations are executed by the military and private diving companies.

What's missing

Country	
Sweden	• An international coordination group (umbrella organisation) is missing in order to sustain cooperation and maintain the knowledge and experience available. - Insight into one another's knowledge and competences • There are no plans in which the cooperation SAR divers, firefighters and chemical responders is described and planned.
Finland	• No information available.
Latvia	• No information available.
Estonia	• No information available.
Lithuania	• No information available.
Poland	• No information available.
Germany	• No information available.
Netherlands	• No information available.

Considerations and future developments

- Look into the possibility to set up an international cooperation group.
- Establish a cooperation between the different SAR organizations around the Baltic Sea and create modules of competences and technical resources ready for quick mobilization and deployment.
  1) Plan regular (yearly) exercises and develops joint methods, materials and competences.
  2) Update available competences and technical resources available annually. Perform gap-analyses on the information, where large gaps are obvious focus the exercises on these areas.
  3) Keep track of developments and lessons learned within diving, keep the representatives of the divers updated with these current affairs and issues.
- Invest in the development and deployment of underwater drones (air and underwater) which can support the divers.

1.3 Maritime related incidents within seaport limits

Leading questions from the questionnaire and interviews

- *Imagine the future of technology in relation to emergencies in major seaports: what developments do you see/expect in the next 10 to 20 years?*
- *Have you heard about any promising developments outside the Interreg Baltic Sea Region cooperation?*

General remarks

- The emergency response responsibilities and capabilities are covered by the respective Port Authorities in collaboration with emergency services including police, fire department, ambulance services, and with local authorities and environmental regulators.
- Most ports do have the essential contingency plans which are exercised on a regular basis.
- Some of the (major) ports do have the availability of emergency anchorage's, quays and jetties.

Considerations and future developments

- Investigate the risks involving alternative fuels for the ships.
- Investigate the risks associated with autonomous shipping.
- Investigate the risks associated caused by the entrance of 'mega vessels' in ports.

1.4 Firefighting aboard ships

Leading questions from the questionnaire and interviews

- *What are the (operational) means available for fire and explosion related incidents in the maritime industry? In relation to hardware (equipment, etc.). What is still missing in your opinion?*
- *Till what extent have these means been tested/exercised under realistic circumstances?*
- *What type of incident scenarios are covered by the present available resources (hard- and software)? What type of incident scenarios are not (yet) covered, which should be covered in your opinion?*
- *Have you have run into situations (incidents/scenarios/exercises) in recent years, which showed (operational) gaps that still need to be resolved? Both from a national as well as international point of view.*
- *What is the available knowledge and experience? What is still missing in your opinion in order to achieve the desired/required goals? Both from a national as well as international point of view.*
- *Imagine the future of technology in relation to fires aboard ships: what developments do you see/expect in the next 10 to 20 years?*
- *Have you heard about any promising developments outside the Interreg Baltic Sea Region cooperation?*

Overview of the operational status per country

Current status

Country	*Current status*
Sweden	• There are several operational ships available with firefighting capacity (see: Swedish Coast Guard fleet).
Finland	• The MIRG teams are situated in Turku and in Helsinki. • The MIRG teams are fully operational. - They train and exercise together. They train at least once per month. - The MIRG equipment is up to standard and comparable with other international MIRG teams. • The MIRG teams are transported by helicopters (Super Puma's) and ships. • Both the Border Guard (Raja) and the Fire Department do have ships that can be deployed in case of maritime incidents. - For incidents further away, the MIRG teams solely rely on the ships of the Coast Guard.

	- The Finnish Border Guard operates offshore Patrol vessels that are equipped for rescue operations, firefighting, emergency towing and demanding environmental duties.
Latvia	• No information available.
Estonia	• No information available.
Lithuania	• No information available.
Poland	• There are no dedicated marine firefighters available. - Fire brigades only work at land
Germany	• Marine firefighting is not part of the responsibility of the 'Spezial-Einsatz-Gruppen' (SEGS). • The German Coast Guard (Küstenwache des Bundes) operates offshore Patrol vessels that are equipped for rescue operations, firefighting, emergency towing and demanding environmental duties. • Standard" and smaller incident scenarios are regularly covered, larger and exceptional scenarios are only seldom trained/exercised. - Several exercises were conducted in the past (e.g., ChemRad, ChemSAR, and Hazard). • Real experience and knowledge were gained during the incidents involving the MS Atlantic Cartier and the CCNI Arauco.
Netherlands	• In the Netherlands there are currently two MIRG teams. One situated in Zeeland (Safety Region Zeeland) and one in Rotterdam (Safety Region Rotterdam Rijnmond). • Both MIRG teams are fully operational. - The MIRG equipment is up to standard and comparable with other international MIRG teams. - The MIRG teams are trained according to a dedicated training programme (training manual) • The MIRG-team of the Safety Region Zeeland forms together with teams from Belgium, France and the UK the MIRG.EU organisation. - They are working according to the same operational procedures - These teams train and exercise together • The Dutch Coastguard operates an Emergency Towing Vessel (ETV) with firefighting capacity (FiFi-1). • For shipboard fires in the Safety Region Zeeland a covenant has been drawn up with a local shipping company concerning additional ships with fifi-capacity.

What's missing

Country	
Sweden	• There is a lack of real experience responding to fires aboard ships. • The Swedish Coast Guard fleet include ships with firefighting capacity. - There is no information available about exercise frequency • Operational remark: "The range and volume for firefighting with foam is too small."
Finland	• No information available.
Latvia	• No information available.
Estonia	• No information available.
Lithuania	• No information available.
Poland	• No information available.
Germany	• Basic knowledge and skills are existing; specialists are increasingly missing in some organisations like the shipping companies.
Netherlands	• No specific items that are missing.

Considerations and future developments

- Look into the possibility for 'mandatory' cooperation (training, exercises) between shipping companies and Fire and Rescue Services.
- Use of drones for assessments and as support for risk assessment,
- Discussions with IMO, EMSA, insurance companies and shipping companies about the preventive measures aboard ships.
  - Tankers are relatively well equipped/prepared, while the fire safety measures aboard container vessel is lacking.
- It will be necessary to continue to work on the effectiveness of responding to maritime incidents. Especially from the point of view that incidents will happen that will be a combination of firefighting, chemical response, counter pollution and SAR (diving operations).
- Consider joining the waterdiving cooperation as the equipment is similar and waterdivers and firefighters are in many cases the same person.

1.5 Counter pollution

Leading questions from the questionnaire and interviews

- *What are the (operational) means available for counter pollution (environmental incidents)? In relation to hardware (equipment, etc.). What is still missing in your opinion?*
- *Till what extent have these means been tested/exercised under realistic circumstances?*
- *What type of incident scenarios are covered by the present available resources (hard- and software)? What type of incident scenarios are not (yet) covered, which should be covered in your opinion?*
- *Have you have run into situations (incidents/scenarios/exercises) in recent years, which showed (operational) gaps that still need to be resolved? Both from a national as well as international point of view.*
- *What is the available knowledge and experience? What is still missing in your opinion in order to achieve the desired/required goals? Both from a national as well as international point of view.*
- *Have you heard about any promising developments outside the Interreg Baltic Sea Region cooperation?*

Overview of the operational status per country

Current status

Country	*Current status*
Sweden	• The Swedish Coast Guard, an independent civil authority under the Ministry of Defence, has national responsibility for dealing with spills of oil and other harmful substances in Swedish waters. • The Swedish Coast Guard has a sizeable fleet of oil recovery vessel which are designed for sustained operations at sea. with the proper equipment/materials to respond to pollution at sea. - The oil spill response has been exercised/tested but there is still room for improvement, especially related to the speed of the response. • Sweden gives priority to mechanical recovery methods. Dispersants or sinking agents are not used.
Finland	• In case of an offshore oil spill, the Border guard is the responsible organisation. In the Archipelago area (biggest risk) the responsible organisation are the Rescue Services.

	- If a large oil spill would happen in the Archipelago Area, assistance from other member states would be necessary. • Regular trainings and exercises are held, including those with neighbouring countries. • There is a bilateral agreement with Russia.
Latvia	• The Latvian Coast Guard Service, under the authority of the Ministry of Defence, has national responsibility for dealing with spills of oil in Latvian marine waters. The State Environmental Service under the Ministry of Environment is the coordinating authority for implementation of the National Oil and HNS Contingency Plan. • The Latvian Coast Guard Service has response stations in the 3 largest Latvian ports – Riga, Liepaja and Ventspils. MRCC Riga, under the Latvian Coast Guard Service, maintains a 24-hour command centre. Operational command for smaller oil spills is initially taken by the MRCC Riga Duty officer and afterwards by the Response Commander. For larger spills the MRCC Committee is convened, and the head of the MRCC Committee would take over operational command. • The State Fire Fighting and Rescue Service, under the Ministry of Interior in co-operation with local municipalities, is responsible for shoreline and beach clean-up. Port authorities are responsible for response operations in port areas. Land and sea activities are jointly carried by the Latvian Coast Guard Service and the State Fire Fighting and Rescue Service. • Equipment and vessels have been tested in real conditions for oil spill response.
Estonia	• Responsibility for marine pollution control in Estonia lies with the ministry of internal affairs. in practise, responsibility for coordination of response to oil at sea is delegated to the Estonian Border Guard (EBG). • The EBG is tasked with the identification of the polluter, evaluation of the spill, assignment of the On-Scene Commander, initiating response operations, and requesting and organising offers of international assistance. • For surveillance an aircraft is available for monitoring and to assist in directing response operations. • For 2024 the deliverance of a new ship, for pollution control, is planned. - At this moment Finland will assist if there is need for counter pollution actions
Lithuania	• Spill response is centred at the Maritime Search and Rescue Coordination Centre (MRCC) of the Lithuanian Naval Force at Kleipeda. • The duty officer at the centre would assume the responsibility of on-scene commander. • The Ministry of Environmental Protection is responsible for the formulation and implementation of the National Contingency Plan. The Ministry of Interior will become involved in any clean-up operations through its responsibility for the Fire Brigades. • A small amount of spill response equipment is available in Klaipeda.
Poland	• Under the act of Maritime Areas and Administration, the ministry responsible for maritime economy acts as the general competent maritime authority. It delegates responsibility for oil spill preparedness and response to the director of the Maritime Search and Rescue Service. • The Polish oil spill lighting system is based on the same structure as the SAR system. - Spillage fighting equipment is distributed in SAR bases along the Polish coast. • There are various ships being able to combat oil pollution. • Mechanical containment and recovery are the primary response options. • There is a civilian special watch for pollution at sea.
Germany	• Environmental incidents are handled by the 'Ministry for Environment' and the 'Hamburg Fire & Rescue Services'. - There are no known gaps concerning knowledge, manpower or equipment.

	- So far, there haven't been any situations that could not be handled with the available equipment. - With the available resources we are able to cover all imaginable scenarios. • Regular exercises with different scenarios (e.g., size of the spill) are being organised. - The organisation was also tested during real emergencies.
Netherlands	• Pollution on the North Sea is traced by satellite images. In case of a pollution, a plane will be sent to the location for verification. There is also 24/7 drone capacity available. • The Ministry of Infrastructure and Environment is the coordinating Ministry for the North Sea. In the event of incidents at sea, the Ministry of Infrastructure and the Environment is the first point of contact and is in command. • The responsible and coordinating organisation for counter pollution in the Netherlands is Rijkswaterstaat. - The organisation for combatting incidents on the North Sea is accessible 24 hours a day and takes action as soon as incidents occur that affect the North Sea. The Coastguard is the central point of contact and coordinates incident control at sea. This is done in close cooperation with Rijkswaterstaat service division Sea and Delta. - The Coastguard Director is in charge of Disaster and Emergency Response. Operational deployment is coordinated from the response and information centre. The Rijkswaterstaat Sea and Delta project organisation is responsible for providing support and advice. Amongst other things, Rijkswaterstaat coordinates offshore oil spills and uses the Arca vessel to deal with such disasters. The organisation can mobilise a larger salvaging capacity if there are more serious pollution incidents. • In the event of disasters in the Wadden Sea or in the Scheldt estuary, there is a direct line with the administrative (land) side, under the responsibility of the relevant safety regions. Rijkswaterstaat facilitates in combating the effects of an incident. • In case of pollution of the North Sea by oil and other harmful substances, 10 different countries and the European Union work together as Contracting Parties to the Bonn Agreement. • There are specific mutual aid agreements with Germany and Denmark. • Rijkswaterstaat has a dedicated counter pollution vessel available (m.s. Arca). And in case of larger incidents, commercial tankers, sand carriers and hopper dredgers can be equipped with sweeping arms.

What's missing

Country	
Sweden	• There is a necessity for closer cooperation between the member states and involved organisations. - More mutual/joint exercises • A common database on shared knowledge and experience of maritime incidents/emergencies. - Containing information about real incidents and lessons learned from training and exercises. • The availability of resources (tanker capacity) for 'ship to ship transfer' (to transfer hazardous material from the casualty to a receiving tanker).
Finland	• There is sufficient knowledge, operational equipment and manpower available to respond to large marine spills.
Latvia	• No information available.
Estonia	• Currently there are no booms (temporary floating barriers) to contain marine spills and to protect the environment available.

Lithuania	• No information available.
Poland	• No information available.
Germany	• There is sufficient knowledge, operational equipment and manpower available to respond to large marine spills.
Netherlands	• No information available.

Considerations and future developments

- In order to maintain and improve the (mutual) operational readiness regular joint exercises, concerning combating of pollution at sea should be organised. This in order to strengthen the operational co-operation in pollution combating operations between the member states involved.
  - Alarm exercises
  - Tabletop exercises
  - Equipment and operational exercises

1.6 Legislation (policy papers)

Leading questions from the questionnaire and interviews

- *What are the most important policy papers related to maritime safety and the preparedness for maritime emergencies in the Baltic Sea Region?*
- *Where do you see room for development and/or further improvement?*
- *Are there specific items/issues in relation to legislation/rules/procedures that are hindering the effectiveness of the emergency response? Taken into account the differences from a member state and stakeholder perspective?*

Overview of the operational status per country

Current status

Country	*Current status*
Sweden	• For spillages of chemicals we use the "HELCOM Manual on Co-operation in Response to Marine Pollution " - The HELCOM Manual on Co-operation in Response to Marine Pollution (in the following the Manual) is applied by the Baltic Sea States in operational co-operation, surveillance activities and combatting exercises since 1983. - Contracting parties are: Denmark, Estonia, EU, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.
Finland	• For spillages of chemicals, we use the "HELCOM Manual on Co-operation in Response to Marine Pollution " (see explanation above – Sweden) • There is a bilateral agreement with Russia and Estonia. • There is a need for supporting manuals and procedures.
Latvia	• For spillages of chemicals, we use the "HELCOM Manual on Co-operation in Response to Marine Pollution " (see explanation above – Sweden) • The National Contingency Plan has been in force since 2004. Within the framework of the contingency plan, GIS sensitive area maps and accident risk assessment calculations are used. Oil spill drift and weather forecast modelling is in place.
Estonia	• For spillages of chemicals, we use the "HELCOM Manual on Co-operation in Response to Marine Pollution " (see explanation above – Sweden) • A national contingency plan is in place, and includes a sensitive atlas, which has been produced for the whole of the Estonian coastline detailing the shoreline type and ecological and socio-economic areas sensitive to oil pollution.

Lithuania	• For spillages of chemicals we use the "HELCOM Manual on Co-operation in Response to Marine Pollution " (see explanation above – Sweden)
Poland	• For spillages of chemicals we use the "HELCOM Manual on Co-operation in Response to Marine Pollution " (see explanation above – Sweden)
Germany	• For spillages of chemicals we use the "HELCOM Manual on Co-operation in Response to Marine Pollution " (see explanation above – Sweden) • There is a contract (procedure) between the Federal Government and the involved Federal States (Bundesländer) that makes it possible to respond to marine emergencies. - Germany's Havariekommando (Central Command for Maritime Emergencies: CCME) will alert the special units ('Spezial-Einsatz-Gruppen': SEGS). • The whole procedure is trained in special courses run by the CCME. • Germany's federal system is sometimes an obstacle for the effectiveness of the emergency response. A homogenous system for prevention would be desirable. • Other papers and documents are the so-called IMO regulations.
Netherlands	• There is an Emergency Response Plan Deltawateren in which the multidisciplinary cooperation in case of maritime emergencies on the Deltawateren (including the River Scheldt) is arranged. • In case of pollution of the North Sea by oil and other harmful substances, 10 different countries and the European Union work together as Contracting Parties to the Bonn Agreement. • The organisation and coordination of maritime emergencies on the North Sea is arranged in the 'Emergency Response Plan North Sea' (in Dutch: Incidentbestrijdingsplan Noordzee)

Considerations and future developments

- Regular meetings (joint tabletop exercises, expert meetings, etc.) in order to exchange knowledge, experience, future developments, etc. which could be used to further improve the usability of emergency response plans.

1.7 Additional observations/remarks

- In order to minimize the risk for emergency response personnel, it is recommended to invest the development of unmanned and remote operated drones and small submarines.
- At the moment research is done for the deployment of hoover crafts for transport and support activities during maritime emergencies (Poland).
- A drone with artificial intelligence to determine pollution (5G solution) is currently tested by LMT (Latvia) and Lufthansa Services. The project uses a nascent drone traffic management platform.
  - The system is ideal for use in ports, with their relatively compact territory but simultaneously complex infrastructure and intensive logistics.
- There are substantial differences in response times among the different stakeholders involved in maritime incident response. This is something to keep in mind.

2. Developments in the maritime industry

2.1 New fuels / 'ship power systems':

- In terms of fuel, the shipping industry is becoming more and more aware of its impact on the environment. Considering the long-term, the shipping industry is doing research into viable and realistic sustainable fuels. At present the following alternative fuels / propulsion systems are being investigated, tested and/or used:
  - LNG powered ships
  - Hybrid propulsion (including renewable energy technologies)
  - Fully electric propulsion
  - Sail Assisted Shipping with Solar Power
  - Fuel and Solar Cell Propulsion (the fuel cell propulsion utilizes power from a combination of fuel cells, solar cells and battery systems)
  - Hydrogen powered ships (not yet built)
  - Methanol and ethanol powered ships (Methyl and ethyl alcohol fuels)
  - Ammonia powered ships

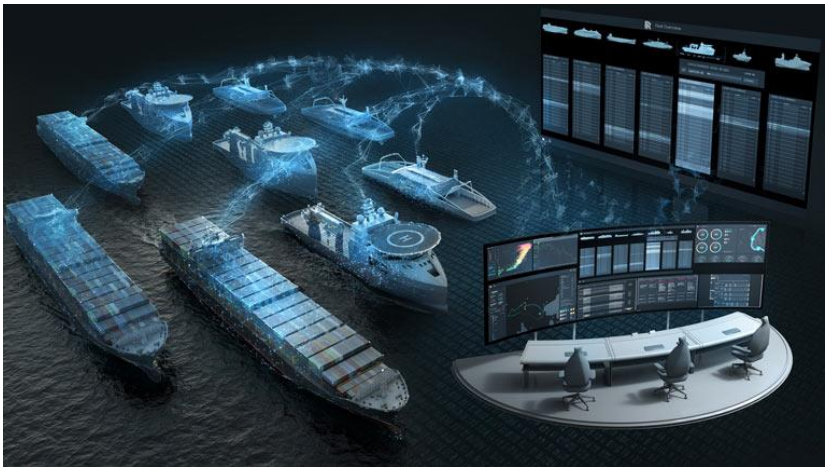
Source: https://c-job.com/ammonia-as-ships-fuel-c-jobs-future-proof-way-of-thinking/

2.2 Different transport movements / cargoes

- Transport of mass volumes of hydrogen by tankers
  - Pilot project planned for the summer of 2021 in Japan
- Car Carriers transporting electric cars
- Tankers to transport ammonia

2.3 Unmanned and autonomous shipping

- Introduction of in an increased 'cyber security' risk
- No crew aboard to assist emergency responders



The future of Land-based control centre in Unmanned and remote-controlled vessels

2.4 Increased ship dimensions

- Ultra Large Container Vessels (399,9 meter and a capacity of 24.000)
- Due to the increased height and width of the ships, firefighting by means of 'firefighting support vessels' becomes increasingly less effective.

HMM Algeciras (24.000 TEU Class vessels eco-friendly container vessel)

2.5 Risk management

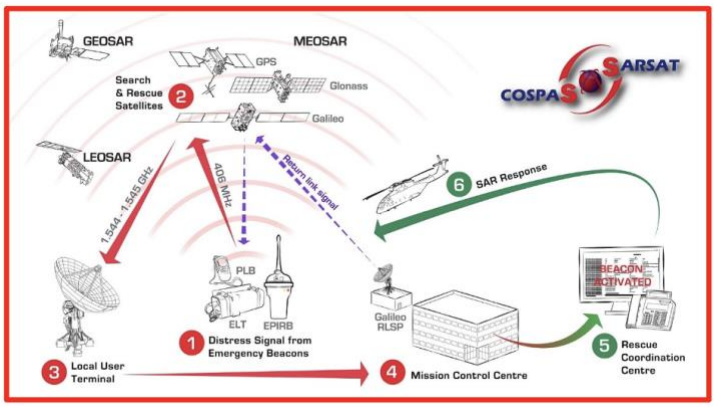
The above listed developments (being not complete) are important to be assessed from a safety and risk perspective.

- A leading question in this assessment should be: 'till what extent does it influence the safety and the effectiveness of the emergency responders and other stakeholders involved?'

3. Developments in Maritime Incident Control/Response

3.1 SAR Galileo

- A global Search and Rescue (SAR) system which quickly locates ships in distress.
- It swiftly relays radio beacon distress signals to the relevant SAR stations, which will have a positive effect on the response times.



3.2 Deployment of drones (air, surface water and under water)

Some advantages of the drones

- Minimising the risks for emergency response personnel.
- Increasing the speed of the assessment (e.g. for SAR operations).
- Possibility to access hazardous areas (as part of the (risk) assessment).
- Use of infrared and other enhanced "senses".
  - Drones being capable of picking up sounds, as well as images, which could help in emergency situations.
- Drones are a lot cheaper than helicopters

a) Remotely controlled aircraft, also called unmanned aerial vehicles or UAVs

"UAV technology has advanced to the stage where its deployment significantly enhances the capability of air search and rescue operations, improving the reach of the service and reducing risk for the public and our crews."
Russ Torbet, director of search and rescue operations for Bristow Helicopters

"Search and rescue is about saving lives. Every second counts and every minute saved can prove the difference between life and death. This kind of technology has a big part to play in those moments alongside our helicopters, coastguard rescue teams and our partners from the RNLI to independent lifeboats and hovercraft."
Claire Hughes, director of HM Coastguard

Two drones used by the UK MCA (left a Baby Shark drone)

A hydrogen-powered drone capable of vertical take-off and landing whilst also being able to fly horizontally efficiently for several hours, developed by the TU Delft, together with the Royal Netherlands Navy and the Netherlands Coastguard.

b) Underwater drones for access below the surface (in and around ships)

Using underwater drones will give SAR forces an additional set of eyes below the surface.
It will assist Emergency Response Organisation(s) in gaining a faster and more complete picture of the underwater situation. In addition it will save both time and reducing risk for human life.

c) Unmanned and remotely operated fireboats

Unmanned fireboats could assist emergency responders at locations with increased risks.

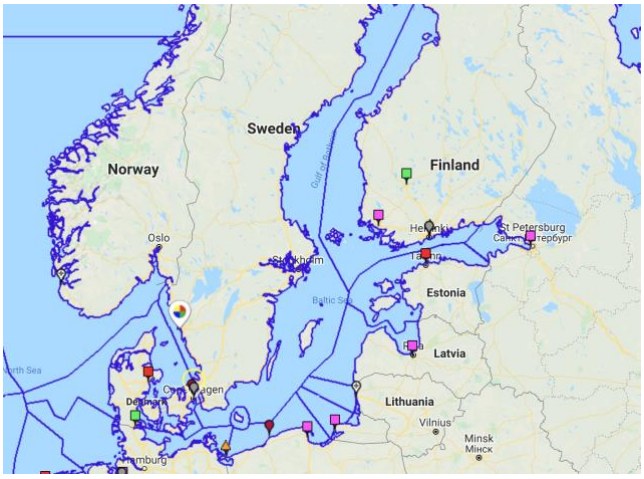
Unmanned and remotely operated fireboat

4. Learning from international initiatives

4.1 Oil pollution Act (OPA 90)

- Shortly after Exxon Valdez, spilled over 11 million gallons of Alaskan crude into the water of Prince William Sound, in March 1989, the Congress voted to pass the Oil Pollution Act (OPA). In force since August 1990, OPA amended the Federal Water Pollution Control Act and outlined how companies are required to prevent, respond to, and pay for oil spills.
- The Oil Pollution Act of 1990 addresses a wide range of problems associated with preventing, responding to, and paying for oil pollution incidents in navigable waters.
- In essence, OPA 90 streamlined and strengthened Environmental Protection Agency's ability to prevent and respond to catastrophic oil spills.
- OPA greatly increased federal oversight of maritime oil transportation, while providing greater environmental safeguards by:
  - Setting new requirements for vessel construction and crew licensing and manning,
  - Mandating contingency planning,
  - Enhancing federal response capability,
  - Broadening enforcement authority,
  - Increasing penalties,
  - Creating new research and development programs,
  - Increasing potential liabilities, and
  - Significantly broadening financial responsibility requirements.

4.2 Command and Control Structure



UK – SOSREP

- Following the SEA EMPRESS casualty in Milford Haven, Wales, in 1996, it became clear that a single voice was needed in such emergencies was a single voice, able to make and enforce decisions on behalf of the UK government and in the overriding public interest, and, if necessary, to override any and all other interested parties.
- The Secretary of State's Representative for Maritime Salvage and Intervention, who is appointed under UK legislation to take control at salvage incidents where there is a threat of significant pollution of UK waters.
- The SOSREP has a unique and critical role in rapidly and effectively marshalling the resources of all parties to achieve the best possible outcome.
- Crucial decisions, particularly at an early stage often need to be taken and involvement of government ministers in operational matters is not always seen as practicable so the role of

SOSREP was established, involving a single person having ultimate control and acting in the public interest. As well as representing the Secretary of State for Transport for conventional shipping casualties SOSREP's powers also extend to representing the Department of Energy and Climate Change in respect of incidents on offshore installations.

Authority of the SOSREP

- Pursuant to several pieces of UK legislation, SOSREP has wide authority. Insofar as ships are concerned, he can step in and issue directions to any ship, shipowner or operator, for the purpose of preventing or reducing pollution, or for safety purposes. In relation to pollution prevention or reduction, his authority extends for 200 nautical miles, or the international median line, whichever is the less. In relation to safety issues, his authority extends only to UK territorial waters – 12 nautical miles.

5. Recommendations/considerations

5.1 Relevance of preparation and cooperation

With a limited number of incidents each year, one could ask whether it is really necessary to have professional, and well-prepared Emergency Response Organisations? The one thing that history tells us about the future is that incidents will continue to happen. It is not the question IF it happens, but WHEN it happens and how severe the incident will be.

Many of the incidents being investigated, show that the difference between a well-controlled emergency and an emergency that grows beyond the control of the Emergency Services is sometimes paper-thin. Conditions like the type of incident, the initial size, the response time, and local circumstances like weather and sea state, are just some examples, having effect on the effectiveness of the response.

If there are no lives at stake on board, and neither does the incident effect the safety of other people and/or the environment, time is of minor importance. However, if there are lives at stake, time will be of utmost importance and this is where a well-prepared emergency response organisation will make the difference. This professional response makes the difference between an incident and a disaster.

5.2 Strengthening of the network-capacity

Information and knowledge sharing is essential for organisations, since it can facilitate decision-making capabilities, build learning organizations and finally, stimulate innovation. Therefore, it's obvious that managing knowledge properly can bring a lot of benefits.

Most of the respondents were very positive about the experiences gained in the four ResQU2 projects (HAZARD, ChemSAR, DiveSMART, and MIRG-EX). The collaboration did, according to the respondents, deliver many valuable results. And in order to continue this, it would be of great added value to form some sort of 'knowledge teams' or 'expert groups'.

Knowledge teams or expert groups

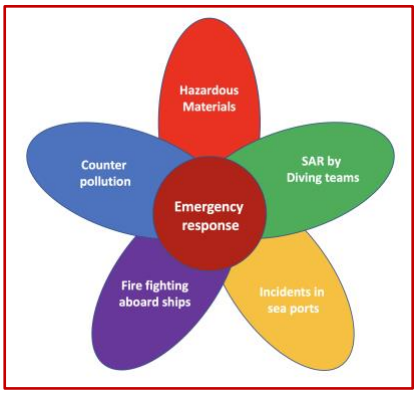
In order to strengthen both the individual and mutual emergency response capacity, it would be of great benefit to set up such teams among the ResQU2 members. They will have the objective of gathering and sharing expertise from various sources in order to strengthen the emergency response network and to improve the quality of the emergency response.

These groups can be of great help by exchanging information about new developments and practices in the field of emergency preparedness and response.

5.3 Development of a mutual (Baltic Sea) emergency response capacity

When incidents occur, emergency responders must work together efficiently and effectively. Most of the problems of emergency co-ordination occur, not within, but between organisations and groups, for people must work together who are not accustomed to doing so, or at least not in the way that emergency situations demand.

During an emergency the priorities are to save and protect lives, rescue and evacuate people, and make environments safe as soon as possible. These objectives require plans, procedures, and working methods. In its essence, it is about coordinating the different stakeholders.



The main challenge is how to integrate emergency response activities with multiple organisations from one or more member states. Due to the increasing complexity of both the emergency situations and response capabilities more attention have to be paid to process of mutual cooperation.

5.4 Information management

It can be stated that effective emergency response to maritime incidents requires critical information in 'real time' over a wide variety of topics. Clear and timely information is vital for every stakeholder to be able to provide timely and effective response and support. The objective of information management is to ensure the accuracy of the information that stakeholders rely in order to be able to make critical decisions.

It can also be stated that information needs are often underestimated during an emergency. According to some of the respondents, the current system of information management is underdeveloped and needs to be upgraded.

Shared situational awareness

At any incident, no single responder agency can appreciate all the relevant dimensions of an emergency straight away. The challenge is to create a shared situational awareness, a common understanding of the circumstances, the (immediate) consequences and implications of the emergency, along with an appreciation of the available capabilities and the priorities of the emergency services and responder agencies (JESIP, 2016).

Shared situational awareness is a common understanding of the circumstances, immediate consequences and implications of the emergency, along with an appreciation of the available capabilities and the priorities of the emergency services and responder agencies.

Achieving shared situational awareness is essential for effective interoperability. Establishing shared situational awareness is important for a common understanding at all levels of command, between incident commanders and control rooms.

Supportive information system

There is a need to reach a common view and understanding of events, risks and their implications and therefore an information system that supports the emergency response organisations involved.

A supportive information system is a technical tool to share and manage information collaboratively to support joint decision making.

Basic principles of a supportive information system

- A system that helps you alert your teams, keep everybody informed and make better decisions during critical events.
- A system that supports the exchange of reliable and accurate information, such as critical information about hazards, risks and threats.

Attachments

A. Information Sources
B. ResQU2 questionnaire and description of process

Attachment A – Information sources

Interviews

	Name/organisation/country	Questionnaire completed
1	Claude Cauwe, SAR Galileo, Belgium	N.A.
2	Miikka Toivonen, Southwest Finland Emergency Services, Finland	Yes
3	Ryszard Klos, Polish Naval Academy, Poland	No
4	Jurgen Krempin, Hamburg Fire Service Academy, Germany	Yes
5	Aleksandrs Pavlovičs, Transport Accident and Incident Investigation Bureau, Latvia	No
6	Marge Kohtla, Politsei, Estonia	No
7	Jonas Westerberg, Dive SMART Baltic, Sweden	Yes
8	Mindaugas Kruopys, Lithuania	No
9	Pieter Jongejan, VRZ, Netherlands	No

Literature/bibliography

Sources

- Report MIRG.eu, Risk Analysis Two-Seas Area, August 2013
- 2019-05-08 OPA 90 - The recipe for success, lessons learned and further actions to be taken
- 2008-11, Gard, Salvage by committee? - The UK system of handling marine emergencies
- 2020 EMSA publication - Annual Overview of Marine Casualties and Incidents

The following websites were consulted

- www.raja.fi (Finnish Border Guard)
- www.kustbevakningen.se/en/ (Swedish Coast Guard)
- www.bundespolizei.de (Küstenwache des Bundes)
- https://en.wikipedia.org/wiki/Border_Guard_(Poland)
- http://www.pasienis.lt/lit/english (State Border Guard Service Lithuania)
- https://www.itopf.org/fileadmin/data/Documents/Country_Profiles/
- www.vugd.gov.lv/en
- www.gsa.europa.eu (SAR Galileo)
- http://www.emsa.europa.eu
- https://www.jesip.org.uk

- https://c-job.com/ammonia-as-ships-fuel-c-jobs-future-proof-way-of-thinking/
- https://www.dronewatch.eu/tu-delft-maritime-hydrogen-drone-takes-off-from-coastguard-vessel/
- https://www.blueyerobotics.com/page/search-and-rescue

Attachment B - Questionnaire

ResQU2 Project Platform

'Enhancing utilisation of technological innovations in maritime incidents and rescue operations.'

Process for the run-up to the online meeting on January 27th, 2021

Overall project outcome

- The main output of the project is a report including a 'Set of recommendations and the best practices' based on an inventory of best practices in technology currently used by the wide maritime incident response and search and rescue community connected to the ResQU2 Project Platform.

Objective first part the project

- To collect information as input for the workshop "Future developments and the relation in maritime incident control", on January 27, 2021.

Steps in order to collect the necessary information as input for the meeting on January 27

1. Draft of initial questionnaire and sending it to the member states (stakeholders)
2. Planning of Teams meetings with the representatives of the individual member states in order to
3. Processing of the received answers/information (questionnaires)
4. Conducting semi-structured interviews (via Teams) with the representatives of the member states (stakeholders)
   - *Semi-structured interviews are a method for data collection in order to collect qualitative, open-ended data, and to explore participant thoughts and beliefs about the questions and answers from the topics raised in the questionnaire.*
5. Processing of the information obtained during the interviews
6. Online meeting on January 27

Questions per topic

1. Incident involving hazardous materials

- What are the (operational) means available (hardware/equipment, etc.) for incidents involving hazardous materials in the maritime industry? What is still missing in your opinion?
- Till what extent have these means been tested/exercised under realistic circumstances?
- What type of incident scenarios are covered by the present available resources (hard- and software)? What type of incident scenarios are not (yet) covered, which should be covered in your opinion?
- Have you have run into situations (incidents/scenarios/exercises) in recent years, which showed (operational) gaps that still need to be resolved? Both from a national as well as international point of view.
- What is the available knowledge and experience? What is still missing in your opinion in order to achieve the desired/required goals?

- Imagine the future of technology in relation to chemical incidents: what developments do you see/expect in the next 10 to 20 years?
- Have you heard about any promising developments outside the Interreg Baltic Sea Region cooperation which could be of use for ResQU2?

2. *Search and rescue operation involving diving teams*

- What are the (operational) means available for search and rescue diver response in the maritime industry? In relation to hardware (equipment, etc.). What is still missing in your opinion?
- Till what extent have these means been tested/exercised under realistic circumstances?
- What type of incident scenarios are covered by the present available resources (hard- and software)? What type of incident scenarios are not (yet) covered, which should be covered in your opinion?
- Have you have run into situations (incidents/scenarios/exercises) in recent years, which showed (operational) gaps that still need to be resolved? Both from a national as well as international point of view.
- What is the available knowledge and experience? What is still missing in your opinion in order to achieve the desired/required goals? Both from a national as well as international point of view.
- Imagine the future of technology in relation to SAR diving operations: what developments do you see/expect in the next 10 to 20 years?
- Have you heard about any promising developments outside the Interreg Baltic Sea Region cooperation?

3. *Maritime related incidents within seaport limits*

- Imagine the future of technology in relation to emergencies in major seaports: what developments do you see/expect in the next 10 to 20 years?
- Have you heard about any promising developments outside the Interreg Baltic Sea Region cooperation?

4. *Firefighting aboard ships*

- What are the (operational) means available for fire and explosion related incidents in the maritime industry? In relation to hardware (equipment, etc.). What is still missing in your opinion?
- Till what extent have these means been tested/exercised under realistic circumstances?
- What type of incident scenarios are covered by the present available resources (hard- and software)? What type of incident scenarios are not (yet) covered, which should be covered in your opinion?
- Have you have run into situations (incidents/scenarios/exercises) in recent years, which showed (operational) gaps that still need to be resolved? Both from a national as well as international point of view.
- What is the available knowledge and experience? What is still missing in your opinion in order to achieve the desired/required goals? Both from a national as well as international point of view.
- Imagine the future of technology in relation to fires aboard ships: what developments do you see/expect in the next 10 to 20 years?
- Have you heard about any promising developments outside the Interreg Baltic Sea Region cooperation?

5. *Counter pollution*

- What are the (operational) means available for counter pollution (environmental incidents)? In relation to hardware (equipment, etc.). What is still missing in your opinion?
- Till what extent have these means been tested/exercised under realistic circumstances?
- What type of incident scenarios are covered by the present available resources (hard- and software)? What type of incident scenarios are not (yet) covered, which should be covered in your opinion?
- Have you have run into situations (incidents/scenarios/exercises) in recent years, which showed (operational) gaps that still need to be resolved? Both from a national as well as international point of view.
- What is the available knowledge and experience? What is still missing in your opinion in order to achieve the desired/required goals? Both from a national as well as international point of view.
- Have you heard about any promising developments outside the Interreg Baltic Sea Region cooperation?

6. *Legislation (policy papers)*

- What are the most important policy papers related to maritime safety and the preparedness for maritime emergencies in the Baltic Sea Region?
- Where do you see room for development and/or further improvement?
- Are there specific items/issues in relation to legislation/rules/procedures that are hindering the effectiveness of the emergency response? Taken into account the differences from a member state and stakeholder perspective?